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The effects of auditory versus visual presentation methods in word recall.

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ABSTRACT

This experiment investigated whether people would remember a series of words more successfully if they heard the words read aloud (auditory method) or if they saw the words written on flash cards (visual method). The experiment was conducted using a within-subjects design. Ten adults (4 males, 6 females) participated in this study. The first condition was administered by the experimenter by reading 15 random words aloud to the participants and the second condition consisted of the experimenter showing participants 15 flash cards with random words written on them. After each condition, participants were then instructed to write down the words they remembered. The hypothesis of the experiment was that people would have better recall of words in the visual condition than in the auditory condition. The results of the study did not support the hypothesis. The results of the experiment were significant, suggesting that people will have greater success remembering words by the auditory method.

1. Introduction

Over the years, there has been much debate among psychologists and educators on the subject of visual and auditory methods in testing of short-term memory. The importance of these investigations lies in an ongoing quest to understand how people are able to most efficiently remember items in short-term memory stores and also to deploy the most effective methods for instruction. Modality effect, or the effect of presentation mode of material and the ensuing rate of retention of information (de Wilde, 2019), forms the basis for the study of auditory versus visual memory. Penney (1975) reported on the importance of modality differences in an investigation of various short-term memory experiments. Auditory modes of presentation consistently resulted in superior short-term memory recall than did visual modes in the studies surveyed. Penney contended that the results were influenced by the finding that the "[c]apacity of the auditory memory store is larger than the visual" (p. 80). A study of volunteer air traffic controllers in Southern France (Galy, Melan, & Cariou, 2010) tested participants' recall of auditory and visual modes of presentation in a recall task using categories of 2 and 3 syllable words. The results were consistent with the researchers' hypothesis that participants would remember words more successfully in the auditory mode than in the visual mode. When short-term memory is being discussed, it is important to mention George Miller's (1956) well-known article regarding the capacity of

short-term memory. After consulting the findings from various experiments that used differing modes of measuring memory, Miller concluded that people can remember seven items, "plus or minus two" (p. 81).

This experiment investigated whether people would have more success in remembering a series of words when they heard them read aloud or if they saw the words written on flash cards. The study was conducted using ten participants, employing a within-subjects design. The participants were asked to write down the words they could remember after being tested with either the auditory or visual mode of presentation. All ten participants were tested by both conditions. The prediction was that people would have superior visual recall for the words they saw on the flash cards because it is widely perceived outside of the scientific community that most people possess stronger visual rather than auditory skills when short-term memory is involved.

2. Methods

2.1 Participants

This study was conducted using a within-subjects design. Ten adults (4 males, 6 females) participated in the study. The age range of the subjects was 42 years to 87 years, with a median age of 60 years. The participants were randomly selected from the researcher's associates, friends, and family.

2.2 Materials

The materials used in this study included a two-page consent form, 15 flash cards, a list of 15 words, and 10 pieces of paper for participants to write on. The consent form was printed on 8.5 x 11 inch white paper and was double spaced, and in 12 point font (Times New Roman). The consent form explained the purpose of the experiment and provided a clear description of the procedures involved. Participants were made aware of how much time the experiment would take, and were ensured that all information collected was anonymous and would be kept strictly confidential (refer to Appendix A). The flashcards used in the study were comprised of 15 pieces of 4-inch by 6-inch white card stock. Each flash card had one word printed on it in black marker, and the letters were 1 inch tall and 1 inch wide (refer to Appendix B). The list of 15 words was written in black marker on one piece of 4-inch by 6-inch white cardstock (refer to Appendix C). Participants were each given 1 sheet of 8-inch by 10.5-inch lined paper to write the words they remembered on.

2.3 Procedure

The researcher first explained the nature of the study to potential participants. Any questions or concerns were addressed by the researcher at this time. Once the participant had agreed to take part in the study, they were given a consent form to read and sign. The experiment took place in a quiet room with no distractions, and the researcher requested that cell phones be turned off. The participant was given a piece of lined paper and a pencil. The researcher and participant were seated across from each other. The auditory method was always performed first and the visual method was tested second, and the words were always read or shown in the same order. When the participant was ready, the researcher began reading the words on the word list, with a 3-second pause between each word. When the researcher was finished reading all 15 words, the participant was instructed to write the words they remembered on the top half

of the piece of paper provided. After 5 minutes, the researcher informed the participant that it was time for the next step of the study. When the participant was ready, the researcher held up each flash card individually, with a 3-second pause between each one. After the 15 flash cards had been shown, the participant was instructed to write the words they remembered on the bottom half of the piece of paper provided. The participant was again given 5 minutes to complete this task. When they had finished, the hypothesis was revealed and the participant and researcher discussed various aspects of the study.

3. Results

The level of significance in this experiment was 0.05. The average words recalled for the auditory method was 7.1 (*SD* = 1.45). See Table 1 and Figure 1 for a summary of the descriptive statistics. The average words recalled for the visual method was 5.8 (*SD* = 1.62). These data were analyzed using a *t*-test and the results were significant, $t(9) = 2.9$, $p = 0.018$, suggesting that people will remember more words by the auditory method.

4. Discussion

The hypothesis in the current experiment was that people would have more success remembering a series of words that they had seen on flash cards than the words they had heard read aloud. The experiment did not support the hypothesis, as participants remembered more of the words that they had heard read aloud.

The results are compatible with previous studies which have overwhelmingly shown that auditory methods of presentation produce superior recall than do visual methods of presentation (e.g., Penney 1975). One way of improving this experiment to ensure more accurate results would be to alternate the order of testing: one subject would be tested by the visual condition first, and the next subject would be tested by the auditory method first. Future research on this topic may include: Comparing participants of differing age groups, testing the visual mode of presentation before the auditory mode of presentation (the opposite as to what was done in this study), and instead of using a within-subjects design, to use a between-subjects design. This research may be applied in educational settings to assist students in knowing which

Table 1. *Means (and Standard Deviations) of words recalled for the Auditory Method and Visual Method.*

	Method Conditions	
	Auditory Method	Visual Method
Words Recalled	7.1 (1.45)	5.8 (1.62)

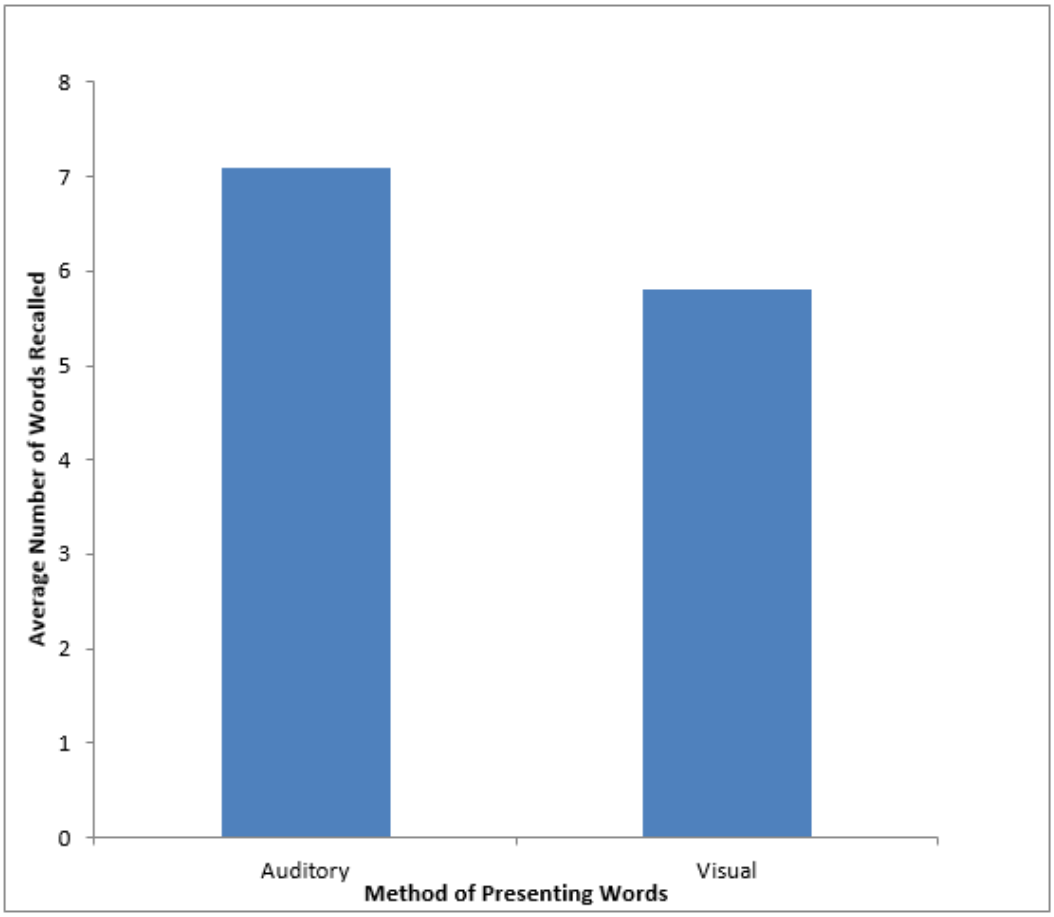

Figure 1. Average number of words recalled by participants using the Auditory and Visual methods.

mode is most beneficial to them, and also for educators to have the advantage of knowing how their students learn most efficiently.

References

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Appendix A

Consent form used in the experiment.

The Effects of Auditory Versus Visual Presentation Methods in Word Recall

This study is investigating whether people have more success remembering a series of words if they hear the words or if they see the words. Before taking part in this study, please read the consent form below. If you understand the statements and freely consent to participate, please provide a signature and date at the bottom of the page.

Consent Form

This study is designed to understand whether people have more success remembering a series of words if they hear the words or if they see the words. The study is being conducted by Rose Sheaff, a student of psychology at Camosun College for the partial fulfillment of the requirements for Psychology 110, Experimental Psychology. The study has been approved by the Instructor of the course, Grace Chan.

Participation of the study takes approximately 5 minutes and is strictly anonymous.

All responses will be kept completely confidential, and in no case will responses from individual cases be identified. Rather, all data will be pooled and then analyzed.

Participation in this study is voluntary, and participants may withdraw from the study at any time.

Participants begin by listening to fifteen words read aloud by the researcher and then writing the words they remember on a piece of paper. Then the researcher will show participants fifteen flashcards and they will write the words they remember on a piece of paper.

If participants have further questions about this study or their rights, they may contact the principal investigator, Rose Sheaff (roseandjill@hotmail.com) or the course instructor, Grace Chan at 250-370-3217 (chang@camosun.ca).

If you are 18 years of age or older, understand the statements above, and freely consent to participate in the study, please sign below:

Signature: _____

Date: _____

Appendix B

Words read aloud in the experiment:

1. green
2. square
3. pencil
4. fast
5. party
6. swim
7. twelve
8. house
9. tree
10. still
11. bark
12. candle
13. fluff
14. paint
15. grass

Appendix C

Words written on flash cards used in the experiment:

1. ten
2. yellow
3. Monday
4. stripe
5. clean
6. sharp
7. maybe
8. warm
9. pretend
10. coffee
11. island
12. lime
13. piano
14. circle
15. person